Argentina: Rural Electrification Services

by Peter Lilienthal and E. Ian Baring-Gould 12/99

Background

Province by province, Argentina is privatizing its electric power sector using two process tracks: grid-connected service and off-grid service. The Secretaria de Energia, in collaboration with provincial authorities, has identified the maximum grid extension region for the near future. All areas outside that region are eligible for regulated, nongrid-connected service. The concession to provide this service as a regulated monopoly is being allocated through a competitive auction process. Two auctions in 1996 and a third held in 1997 will serve as the pilot for a nationwide program funded by the World Bank. Though details differ in each province, a consistent part of the program is to determine the maximum tariff that private companies can charge. Reliance on renewable energy technologies as part of the rural electrification process has also been emphasized.

Scope

The National Renewable Energy Laboratory (NREL) has provided technical assistance to the Argentine concessions program and other organizations interested in renewable technologies. NREL staff helped in designing the subsidy and tariff structure and in estimating the cost of the concessions program. The subsidy and tariff structure provide the concessionaire with a revenue stream sufficient to maintain a sustainable operation and gives the end-users appropriate incentives to ensure efficient use of the electricity. These two features are often absent in rural electrification programs and result in substantial burdens on the government and limit the expansion of rural electrification services.

NREL provided information on the costs and applicability of hybrid-powered, collective mini-grid systems and on the systems design for the electrification of rural schools. NREL has also provided technical assistance to organizations interested in the definition of wind-based power systems for both home and mini-grid use. In addition, NREL and the American Wind Energy Association have assisted in collecting wind-speed data for water-pumping applications in the province of Santa Fe.

Status

NREL, with assistance from the National Rural Electric Cooperative Association (NRECA)-Bolivia, reviewed the Secretaria de Energia's estimates of the expected costs of a business supplying solar home systems. NREL then made recommendations (based on the estimated costs and the methods used) to calculate the likely success of such an enterprise dependent on the size of the business. Using different business plan scenarios, a methodology was developed to identify the cost of service and the required tariff and subsidy as a function of the number of customers the business might have. The methodology can be easily adapted to different regions, where the business costs and infrastructure requirements may be different. This methodology has been used in two provinces, Salta and Jujuy, where concessions have already been granted.

Funding of $120 million from the World Bank and the Global Environmental Facility will allow additional provinces to participate in the concession program. Wind resource mapping is also being added to the methodology in the concession program's third province, La Rioja. Project funding will also be used to investigate different methods of supplying rural populations with renewable energy. One such project will compare wind home systems to solar home systems in applicable regions.

NREL is also providing technical assistance to Servicios Publicos, S.E. (SPSE), the primary utility in the Santa Cruz province, to retrofit diesel-based power systems. SPSE currently operates diesel power systems that could be retrofitted with wind generation. SPSE and NREL are working on the pilot retrofitting of the power system in the community of Tres Lagos. This power system

supplies a 70-kW peak demand, operates 24 hours a day, and provides residential, commercial, and public service for this isolated community using three diesel generators. The proposed hybrid power system is expected to save $0.03/kWh to $0.05/kWh in generation cost, reduce fuel consumption by approximately 60%, and allow reduced staffing requirements. This project will be bid commercially by SPSE with assistance from an outside project manager familiar with the retrofitting process. NREL will continue to provide impartial technical assistance. The U.S. Department of Energy will also assist by contributing part of the expense of the wind generation equipment.

Planned Activities

NREL continues to assist in the development and application of the tariff methodology and the inclusion of renewable components for additional concession projects. The methodology may be used as a template for other regions and countries where renewable energy is being considered in rural electrification systems. Work with SPSE on the hybridization of diesel power plants in Santa Cruz will continue and the Tres Lagos plant is expected to complete hybridization by late 2000 or early 2001. NREL will also partner with the Secretaria de Energia and private concessionaires on suitable renewable technologies and wind resource mapping for other provincial concession programs.

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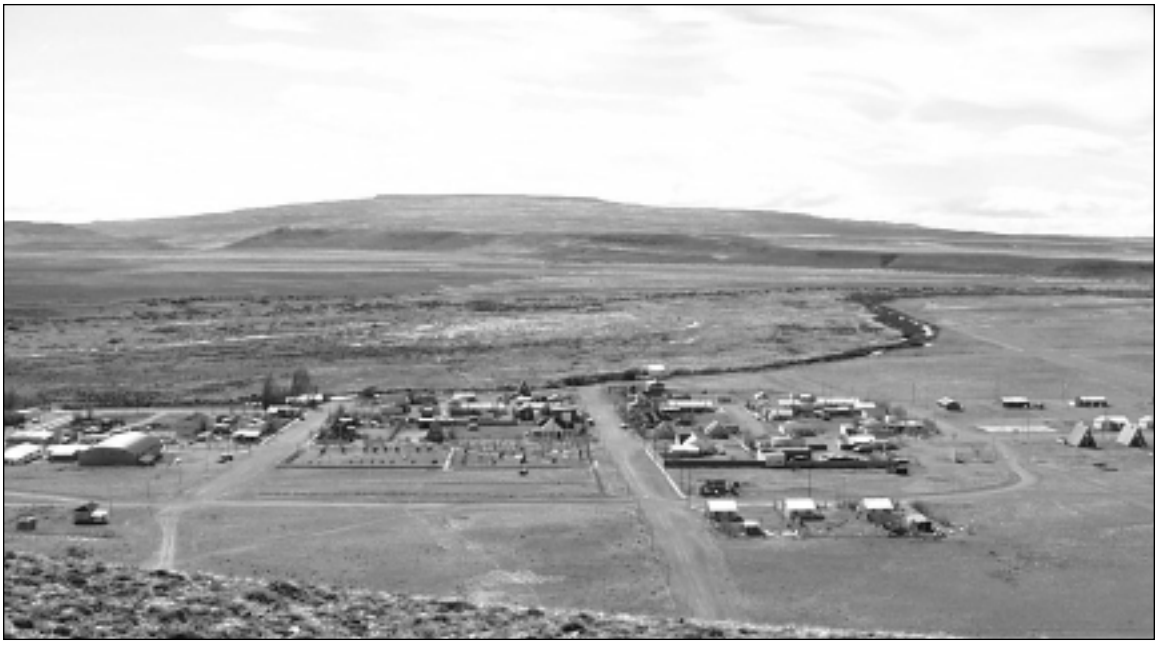

Community of Tres Lagos, proposed site of wind/diesel hybrid system.